IPCS INCHEM Home

# NITROGEN DIOXIDE
(cylinder)

**ICSC:** 0930
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Dinitrogen tetroxide (see notes)
Nitrogen tetroxide
Nitrogen peroxide

**CAS #: 10102-44-0** RTECS #: QW9800000
UN #: 1067
EC #: 007-002-00-0
EINECS #: 233-272-6

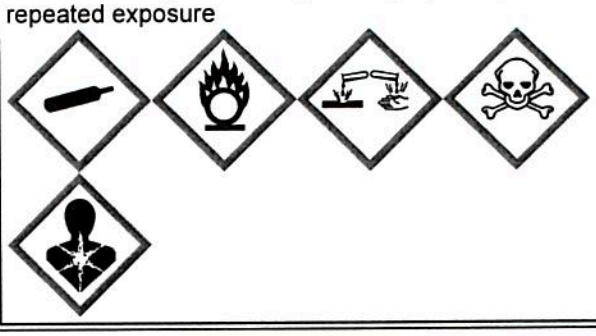
Formula: $NO_2$
Molecular mass: 46.0

| TYPES OF HAZARD / EXPOSURE | ACUTE HAZARDS / SYMPTOMS | PREVENTION | FIRST AID / FIRE-FIGHTING |
|---|---|---|---|
| **FIRE** | Not combustible but enhances combustion of other substances. | NO contact with combustible substances. | In case of fire in the surroundings, use appropriate extinguishing media. |
| **EXPLOSION** | | | In case of fire: keep cylinder cool by spraying with water. |
| | | | |
| **EXPOSURE** | | **AVOID ALL CONTACT!** | **IN ALL CASES CONSULT A DOCTOR!** |
| **Inhalation** | Cough. Sore throat. Shortness of breath. Dizziness. Headache. Burning sensation. Laboured breathing. Nausea. Symptoms may be delayed. See Notes. | Use breathing protection, closed system or ventilation. | Fresh air, rest. Half-upright position. Administration of oxygen may be needed. Refer immediately for medical attention. |
| **Skin** | Redness. Burning sensation. Pain. Serious skin burns. | Protective gloves. Protective clothing. | First rinse with plenty of water for at least 15 minutes, then remove contaminated clothes and rinse again. Refer immediately for medical attention. |
| **Eyes** | Redness. Pain. Severe burns. | Wear safety goggles or eye protection in combination with breathing protection. | Rinse with plenty of water for several minutes (remove contact lenses if easily possible). Refer immediately for medical attention. |
| **Ingestion** | Burns in mouth and throat. | Do not eat, drink, or smoke during work. | Rinse mouth. Do NOT induce vomiting. Refer immediately for medical attention. |

| SPILLAGE DISPOSAL | PACKAGING & LABELLING |
|---|---|
| | |

Evacuate danger area! Consult an expert! Personal protection: gas-tight chemical protection suit including self-contained breathing apparatus. Ventilation. Do NOT absorb in saw-dust or other combustible absorbents. Remove vapour with fine water spray. Neutralize used water with chalk or soda.

**EC Classification**
Symbol: O, T+; R: 8-26-34; S: (1/2)-9-26-28-36/37/39-45; Note: 5
**UN Classification**
UN Hazard Class: 2.3; UN Subsidiary Risks: 5.1 and 8
**GHS Classification**
Signal: Danger
Contains gas under pressure; may explode if heated
May cause or intensify fire; oxidizer
Fatal if inhaled
Causes severe skin burns and eye damage
Causes damage to lungs
Causes damage to the lungs through prolonged or repeated exposure



| EMERGENCY RESPONSE | SAFE STORAGE |
|---|---|
| | Ventilation along the floor. Separated from combustible substances and reducing agents. |

## IMPORTANT DATA

**Physical State; Appearance**
REDDISH-BROWN GAS OR BROWN OR YELLOW LIQUID WITH PUNGENT ODOUR.

**Physical dangers**
The gas is heavier than air.

**Chemical dangers**
The substance is a strong oxidant. It reacts violently with combustible and reducing materials. Reacts with water. This produces nitric acid and nitric oxide. Attacks many metals in the presence of water.

**Occupational exposure limits**
TLV: 0.2ppm as TWA; A4 (not classifiable as a human carcinogen); (ACGIH 2013).
MAK: 0.5 ppm, 0.95 mg/m³; Carcinogen category: 3B; Peak limitation category: I(1); Pregnancy risk group: D; (DFG 2013).

**Routes of exposure**
The substance can be absorbed into the body by inhalation.

**Inhalation risk**
A harmful concentration of this gas in the air will be reached very quickly on loss of containment.

**Effects of short-term exposure**
The substance is corrosive to the eyes, skin and respiratory tract. Exposure at high concentrations could cause asphyxiation due to swelling in the throat. Inhalation of the gas or vapour may cause lung oedema. See Notes. Exposure far above the OEL could cause death. The effects may be delayed. Severe effects may occur following a prolonged symptom-free period. Medical observation is indicated.

**Effects of long-term or repeated exposure**
The substance may have effects on the lungs. This may result in impaired functions and decreased resistance to infection.

| PHYSICAL PROPERTIES | ENVIRONMENTAL DATA |
|---|---|
| Boiling point: 21.2°C<br>Melting point: -11.2°C<br>Relative density (water = 1): 1.45 (liquid)<br>Solubility in water: reaction<br>Vapour pressure, kPa at 20°C: 96<br>Relative vapour density (air = 1): 1.58 | |

## NOTES

The commercial brown liquid under pressure is an equilibrium mixture of nitrogen dioxide and the colourless nitrogen tetroxide (CAS 10544-72-6).
Non irritant concentration may cause lung oedema.
The symptoms of lung oedema often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential.
Immediate administration of an appropriate inhalation therapy by a doctor, or by an authorized person, should be considered.
Rinse contaminated clothing with plenty of water because of fire hazard.
Turn leaking cylinder with the leak up to prevent escape of gas in liquid state.

## ADDITIONAL INFORMATION

**IPCS**
International Programme on Chemical Safety

Prepared in the context of cooperation between the International Programme on Chemical Safety and the European Commission


See Also:
Toxicological Abbreviations